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“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

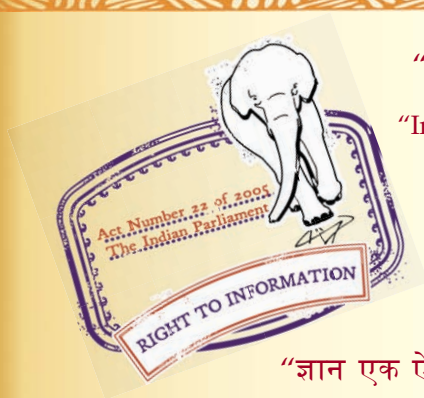
“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 3168 (1981): Brass Strip and Foil for Deep Drawing [MTD
8: Copper and Copper Alloys]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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IS : 3168 - 1981

(Reaffirmed 2006)

Indian Standard
SPECIFICATION FOR
BRASS STRIP AND FOIL FOR
DEEP DRAWING
(*First Revision*)

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Indian Standard

SPECIFICATION FOR BRASS STRIP AND FOIL FOR DEEP DRAWING (*First Revision*)

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Indian Standard
SPECIFICATION FOR
BRASS STRIP AND FOIL FOR
DEEP DRAWING
(*First Revision*)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 18 September 1981, after the draft finalized by the Copper and Copper Alloys Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 Brass strip and foil are subject to deep drawing operation and processed in automatic progressive type of tooling either in single or in multi-punchings, for making such products as press buttons, eyelets, lamp caps, clips, etc.

0.3 This standard was earlier published in 1965. In this revision, grade CuZn35 has been deleted as it was found to be obsolete. Chemical composition of other grades has been revised. Clauses on 'grain size and hardness' have also been modified. A clause on 'Erichsen values' has been introduced and tensile properties have been deleted.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers requirements of two grades of brass strip and foil used for deep drawing.

*Rules for rounding off numerical values (revised).

2. TERMINOLOGY

2.0 For the purpose of this standard the following definitions as given in IS : 3288 (Part I)-1981* shall apply.

2.1 Strip — Flat product over 0.15 mm thick and up to and including 10 mm thick, of any width, and generally not cut to length; usually in coil, but may be flat or folded.

2.2 Foil — A flat product of thickness up to and including 0.15 mm of any width generally not cut to length; usually in coil but may also be in flat or folded form.

3. SUPPLY OF MATERIAL

3.1 General requirements relating to the supply of brass strips and foils shall be as laid down in IS : 1387-1967†.

4. CHEMICAL COMPOSITION

4.1 The material when analysed in accordance with IS : 3685-1966‡ shall meet the requirements as given in Table 1.

TABLE 1 CHEMICAL COMPOSITION

DESIGNATION	PERCENT				
	Copper Plus Incidental Nickel up to 0.7	Lead	Iron	Total Impurities	Zinc
		<i>Max</i>	<i>Max</i>	<i>Max</i>	
(1)	(2)	(3)	(4)	(5)	(6)
CuZn30	68.5 to 71.5	0.05	0.05	0.20	Remainder
CuZn37	61.5 to 64.5	0.10	0.05	0.25	Remainder

5. MANUFACTURE

5.1 The strip and foil shall be finished by cold rolling and supplied finally in the annealed temper as per the hardness and average grain size requirements given in 6. The material shall be supplied in coil form unless otherwise required by the purchaser.

*Glossary of terms for copper and copper alloys: Part I Cast form and wrought form (main types) (*second revision*).

†General requirements for the supply of metallurgical materials (*first revision*).

‡Methods of chemical analysis of brasses.

6. PHYSICAL PROPERTIES

6.1 Grain Size and Hardness — The average grain size and hardness of the material when determined in accordance with IS : 4748-1967* and IS : 2866-1965† respectively shall be as specified in Table 2.

6.2 Erichsen Values — Since the material is meant for deep drawing, the following minimum Erichsen values shall be fulfilled. The values depend on composition and thickness. The intermediate values should be selected for intermediate thickness:

<i>Thickness</i> mm	<i>Erichsen Value, mm for Grade</i>	
	CuZn30	CuZn37
0.1	10.19	9.0
0.15	10.5	9.4
0.2	10.8	9.8
0.25	11.05	10.1
0.3	11.31	10.45
0.35	11.5	10.7
0.4	11.65	11.0
0.5	12.01	11.4
0.6	12.23	11.6
0.7	12.42	11.8
0.8	12.59	12.0
0.9	12.8	12.2
1.0	13.0	12.4
1.2	13.3	12.7
1.5	13.7	13.0
1.8	14.1	13.5
2.0	14.3	14.0

7. FREEDOM FROM DEFECTS

7.1 The strip and foil in the finished condition shall be clean, smooth and free from stains, oils, cracks, blow holes, inclusions or other defects. The edges of the strip or foil shall be free from burrs.

*Method for estimating average grain size of metals.

†Method for Vickers hardness test for copper and copper alloys.

TABLE 2 GRAIN SIZE AND HARDNESS

(Clause 6.1)

DESIGNATION	GRAIN SIZE			HV HARDNESS Maximum
	Nominal	Minimum	Maximum	
CuZn30	0.050	0.035	0.070	70
	0.035	0.025	0.050	75
	0.025	0.015	0.035	80
CuZn37	0.035	0.025	0.050	75
	0.025	0.015	0.035	80

8. SIZE AND TOLERANCES

8.1 Sizes — The material shall be supplied to sizes specified by the purchaser. It is recommended that these sizes should be selected from IS : 3052-1974*.

8.2 Tolerance

8.2.1 The tolerances on width and thickness shall be as given in IS : 3052-1974* for cold rolled strip and foil.

9. EDGEWISE CURVATURE

9.1 The edgewise curvature of the slit strip or foil when measured on a length of 2 metres shall not exceed 12 mm.

10. SAMPLING AND RETEST

10.1 Sampling — When tests are specifically called for by the purchaser, quantities of strip (or foil) of the same width, thickness and temper shall be batched together. For each batch the number of samples taken shall be as given below:

The samples shall be cut off cold and shall receive no further treatment (except that they may be machined to the shape of the test piece) before being tested.

10.1.1 From batches weighing up to 1 000 kg the number of samples taken shall be in the proportion of one per 200 kg of material submitted, and fractional remainder being considered as 200 kg. Where strip is supplied in coils weighing more than 200 kg, one sample shall be taken from each coil to provide the necessary test pieces. If the purchaser

*Dimensions for wrought copper and copper alloys, sheet, strip and foil (for general engineering purposes) (*first revision*).

requires more than one sample to be taken from any coil, the method of taking the additional sample or samples shall be agreed to between the supplier and the purchaser.

10.1.2 Batches exceeding 1 000 kg shall be sub-divided into smaller batches of not less than 200 kg and not more than 1 000 kg to which the provision of **10.1.1** shall then apply.

10.2 Retests — Should any one of the test pieces first selected by the purchaser or his representative fail to pass any of the prescribed tests, two further samples from the same batch shall be selected for testing, one of which shall be from the strip or foil from which the original test sample was taken, unless that strip or foil has been withdrawn by the supplier. Should the test piece from both these additional samples pass, the batch represented by the test sample shall be deemed to comply with this standard. Should the test pieces from either of these additional samples fail, the batch represented by the test samples shall be deemed not to comply with this standard. The supplier shall, if required, certify that the strip or foil complies with the requirements of this standard appropriate to the material ordered.

11. PACKING

11.1 Strip or foil shall be packed in bundles, boxes or crates as agreed to between the purchaser and the manufacturer.

12. MARKING

12.1 Each bundle, box or crate shall be legibly marked with the name of the manufacturer or supplier, the alloy designation of the material, condition, dimensions and mass.

12.1.1 The material may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors may be obtained from the Indian Standards Institution.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	$1 \text{ N} = 1 \text{ kg.m/s}^2$
Energy	joule	J	$1 \text{ J} = 1 \text{ N.m}$
Power	watt	W	$1 \text{ W} = 1 \text{ J/s}$
Flux	weber	Wb	$1 \text{ Wb} = 1 \text{ V.s}$
Flux density	tesla	T	$1 \text{ T} = 1 \text{ Wb/m}^2$
Frequency	hertz	Hz	$1 \text{ Hz} = 1 \text{ c/s (s}^{-1}\text{)}$
Electric conductance	siemens	S	$1 \text{ S} = 1 \text{ A/V}$
Electromotive force	volt	V	$1 \text{ V} = 1 \text{ W/A}$
Pressure, stress	pascal	Pa	$1 \text{ Pa} = 1 \text{ N/m}^2$